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life



NEWSLETTER OF THE LONDON CHAPTER,
ONTARIO ARCHAEOLOGICAL SOCIETY
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01-3

Spring is here, time to get down and dirty!

If anyone has any ideas for Chapter gatherings (i.e., summer picnic), please pass them along to a member of the Executive.

Next meeting will be September 13th. As always, our meeting will be held at 8 pm at the London Museum of Archaeology, 1600 Attawandaron Road, near the corner of Wonderland & Fanshawe Park Road, in the northwest part of the city.

Chapter Executive

ANNUAL RATES

Individual.....	\$18.00
Student.....	\$15.00
Institutional.....	\$21.00
Subscriber.....	\$20.00

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DISCOVERY OF THE DELHI BURIAL

PETER A. TIMMINS

In May of 2000 a human cranium was unearthed by landscapers excavating a pond in Middleton Township near the Town of Delhi. The Ontario Provincial Police were contacted and the local coroner attended the site and concluded that the human remains were not a forensic matter. The find was subsequently investigated by the writer on behalf of the Heritage Unit of the Ontario Ministry of Citizenship, Culture and Recreation. A brief examination determined that articulated post-cranial remains were present and that a single human interment was represented. Further investigation was undertaken with the assistance of Professor Andrew Nelson of the Department of Anthropology at the University of Western Ontario. Dr. Nelson provided prepared a brief report on his investigation that was submitted to the MCZCR and the Registrar of Cemeteries. His report confirmed that the individual was of Aboriginal descent and was buried in a tightly flexed position oriented to the east. The individual was judged to be female based on its small size and gracile features. Evidence for disturbance was noted in the thoracic region where some ribs and vertebrae were missing or highly fragmented.

The Six Nations Council was contacted as representatives of the deceased and permission was granted to exhume the skeleton and hold the remains for later reburial. The Six Nations representative also agreed to permit study of the remains to determine the sex, age, and general health of the individual. After obtaining clearance from the Registrar of Cemeteries, the burial was excavated by Ministry staff in June of 2000.

The interment was located on a prominent sand knoll that has been heavily disturbed by a house, a swimming pool, a gas line, landscaping and outbuildings. The soils were extremely sandy and there was no soil discoloration indicating a burial pit. All soil from the excavation was screened through 6 mm mesh to recover small bones. The remains were in relatively good condition. The landowners reported that Aboriginal artifacts had been found in the vicinity, but it is not known if the burial was originally associated with a settlement, or with other burials that may remain in the vicinity. Since no artifacts were found in association with the remains, it is not possible to determine the age and cultural affiliation of the burial with precision. However, judging by the condition of the bones, the style of the burial, the lack of grave offerings, and the known culture history of the area, it is most likely that the interment dates to the Early Iroquoian period between ca. A.D. 1000 and A.D. 1300.

The writer would like to thank the following individuals for their assistance in the Delhi burial investigation: Dr. Andrew Nelson, Department of Anthropology at the University of Western Ontario, Barb Harris, Six Nations Council, Cora dela Cruz, Registrar of Cemeteries, Ministry of Consumer and Commercial Relations, Dr. Michael Spence, Department of Anthropology, University of Western Ontario, Detective Constable Joe Zwambag, Ontario Provincial Police, John Macdonald, Ministry of Tourism, Culture and Recreation, and Jaime Ginter of the Department of Anthropology, University of Western Ontario. In particular, Jaime devoted many hours to the analysis of the Delhi woman. The results of her study, presented here, provide an excellent example of what we can learn from the detailed examination of an apparently isolated human interment.

THE DELHI WOMAN: AN OSTEOBIOGRAPHY OF AN EARLY ONTARIO IROQUOIAN

JAIME GINTER

INTRODUCTION

An osteobiography is a relatively new endeavor in the field of bioarchaeology. The term "osteobiography", as coined by Frank Saul in 1989, is defined as an attempt to reconstruct the life of an individual who lived in the past through an examination of his or her skeletal remains. In other words, the goal of an osteobiography is to attempt to relate the condition of a particular individual's skeletal remains to possible events, activities, and subsistence practices that the individual was involved in during life.

The individual who is the focus of this osteobiography is an Early Ontario individual who has come to be known as the Delhi woman. Her remains were discovered last summer by a landscaper who was constructing a pond in the backyard of a residence near Delhi, Ontario. I was asked to conduct a laboratory analysis of the remains in an effort to determine the age, sex, ancestry and health of this individual. As I was examining the remains for evidence of trauma, and the presence or absence of pathology I began to wonder about this individual's lifestyle, and the events that left their mark on her bones. As the title of this article suggests I wanted to put the flesh back on her bones and try to see if I could come up with some plausible scenarios to explain the condition of her remains.

In order to make these sorts of inferences about her life it was necessary to gain some knowledge about the cultural time period in which she lived. Dr. Timmins stated in his excavation report of this burial that the location of the remains and the manner of the burial indicated that this individual lived during the Early Ontario Iroquoian period (Timmins, 2000). Unfortunately, very few skeletal analyses of Early Ontario Iroquoian populations exist, and considering that this was a solitary find there was not any related burial and skeletal information to use for comparison. However, the report for the Bennett Site did include an extensive analysis of the skeletal material excavated. The Bennett site is a late Early Ontario Iroquoian village that relied upon maize as their primary means of subsistence (Wright and Anderson, 1969). The Bennett site is located around the Western shores of lake Ontario in what some consider Pickering territory. If we adhere to the traditional classification of Early Ontario Iroquoian sites, the area of Delhi would be considered Glenn Meyer territory, while the Bennett site would be considered to be in Pickering territory (Williamson, 1990; Wright, 1966). Although these two sites are classified as belonging to the different branches of the Early Ontario Iroquois tradition, I believe that this comparison would be beneficial in order to try to determine what form of subsistence the Delhi woman was dependent on. Knowledge of the subsistence practices of the Bennett site is valuable because analyses of skeletal and dental remains have indicated a gradual rather than rapid increase in the utilization of maize between AD 400 and AD 1200 (Williamson, 1990:311). Although corn has been found at some Early Ontario Iroquoian sites, it was not until the fourteenth century during late Early Ontario Iroquoian period that maize horticulture was adopted as the primary source of subsistence (*Ibid*). Therefore, I thought that it would be

interesting to compare the health, in particular the dental health, of the Delhi woman to that of the individuals at the Bennett site, in an effort to determine what form of diet the Delhi woman was consuming, as well as what activities she was involved in. Fortunately, two of the individuals excavated and analyzed at the Bennett site were female and in the same age range as the Delhi woman.

THE METHOD OF BURIAL

The remains that were discovered in Delhi were those of a woman who was between the ages of 40 to 50 years when she died. The individual was interred face down, but was shifted slightly onto her left side. She had been interred in a tightly flexed position with her knees up near her chin. Her left arm appears to have been placed in front of her chest with her hand resting by the left ear. The right arm was bent at the elbow and was placed behind her back. Flexed burials were common among Early Ontario Iroquoian groups. Other Early Iroquoian sites in the Delhi area including the Elliot and Bruce Boyd sites contained a variety of burial types, thus making it impossible to determine if this method of burial was a regional or cultural practice (Spence, 1994).



Figure 1. The remains *in situ*

The burial was mostly complete with the exception of a number of bones in the thoracic region. It was originally speculated that this might be a secondary bundle burial, as indicated by the missing elements from this area. As Figure 2 demonstrates the disturbance in the thoracic region appears to be localized. It is possible that at some point the thoracic area was disturbed by someone who did not realize what he or she had encountered. However, the complete excavation yielded most of the bones of the hands and feet as well as some small sesamoid bones that are often associated with the metatarsals. In secondary burials usually the largest skeletal elements are removed from the initial interment for transfer to the secondary burial, while small bones like the bones of the feet and hands are usually left

behind (Spence, 1994:15). Since the majority of the bones of the hand and feet were present it is fairly safe to conclude that this is a primary burial.

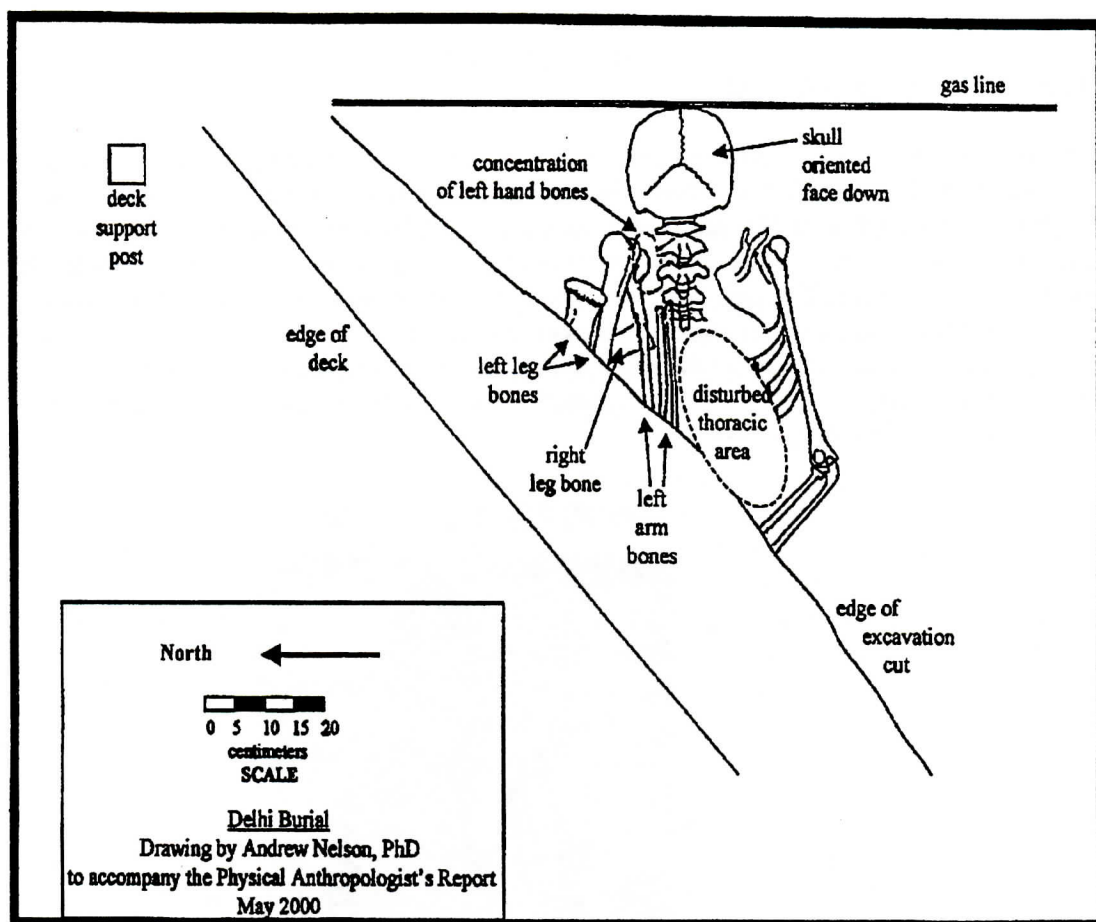


Figure 2. Drawing displaying disturbed area

DENTAL HEALTH

The two individuals from the Bennett site that I chose for comparison, Individual 5-1 and Individual 13, were both estimated to be between 40 to 50 years at death, were relatively well preserved, and were interred in flexed burials (Wright and Anderson, 1969). Patterson had conducted an extensive analysis of their dental health and had provided a detailed description of the condition of their dentition. The condition of the Delhi woman's dentition was compared to that of these two women in an attempt to determine if her diet could be determined.

Different types of subsistence have varying affects on the dentition. Individuals who participate in fishing-hunting and gathering lifestyles tend to exhibit pronounced attrition, periodontal disease, abscesses of the alveolar bone, and a low incidence of caries (Patterson,

1984:2). A diet consisting of fishing, hunted and gathered foods is very coarse and unrefined. This results in heavy wear on the chewing surfaces of the teeth. Fishing-hunting and gathering diets are high in protein and low in carbohydrates. This explains the low incidence of caries, which are caused by diets high in carbohydrates. On the other hand, individuals who rely on a horticultural economy for their subsistence tend to exhibit low to moderate attrition, moderate periodontal disease, high antemortem tooth loss, and a high incidence of caries (*Ibid.*). Maize requires processing to maximize the nutritional potential of the food. Processed food is much less abrasive, and thus does not cause as much wear on the chewing surface of the tooth. On the other hand, corn is high in carbohydrates and is very carious.

The dental health of the Dehli woman is very poor. Both her upper and lower teeth exhibit a high degree of wear (Figure 3). Almost all of the enamel on her molars was been worn away exposing the dentine and pulp cavity. In comparison, the Bennett individual's teeth display only moderate wear, exposing only small patches of dentin on the chewing surfaces (Patterson, 1984). The degree of wear on the teeth of individual 5-1 is slight compared to that of the Delhi woman. As noted above, greater tooth wear is equated with hunting-fishing and gathering diets, while slight tooth wear is associated with agricultural diets. The differences in tooth wear exhibited by these individuals serve as one line of evidence to support the theory that Early Iroquoian groups were not primarily subsisting on cultigens, but that they did form some part of their diet.

The teeth of the Delhi woman also exhibit a high degree of antemortem tooth loss with resulting alveolar resorption (Figure 4). 12 teeth were lost before death, 9 in the maxilla and 3 in the mandible. This high incidence of tooth loss before death is probably the result of two forces. One possibility is that the extreme degree of wear that we just observed exposed the pulp cavity and may have disrupted this tooth to such a degree that the tooth died and was subsequently lost. Another possibility is that the exposure of the pulp cavity as a result of extreme wear would have provided the perfect conditions for the development of caries. Since the pulp cavity was already exposed the possibility of the pulp cavity becoming infected as a result of carious action would have been greater.

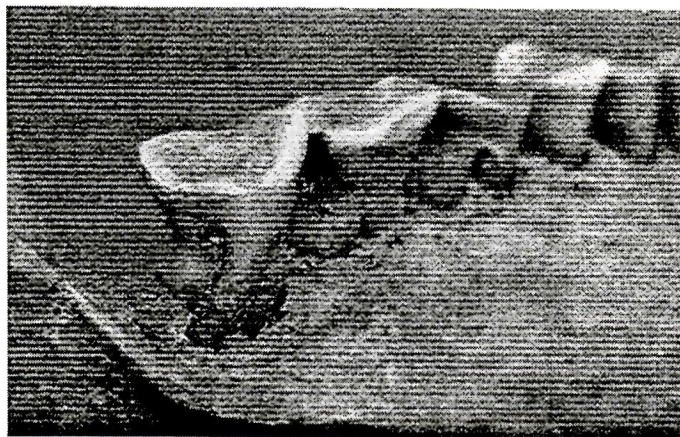


Figure 3. Degree of Attrition

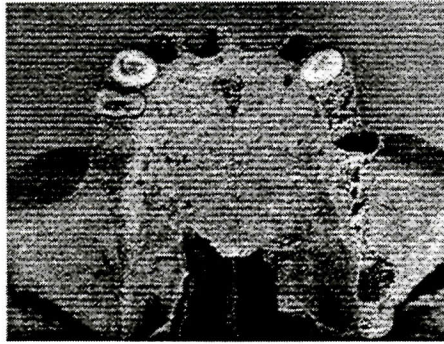


Figure 4. Antemortem tooth loss

Table 1. Comparison of Antemortem tooth loss

Individual	Antemortem Loss	# Maxillary Lost	# Mandibular Lost
Delhi	12	9	3
5-1	7	12	9
13	21	N/A	N/A



Figure 5. Dental caries

When we examine the degree of antemortem tooth loss in the Bennett women, it is difficult to see a stark contrast (Table 1). Although the Delhi woman displays more antemortem tooth loss as compared to Bennett individual 5-1, Bennett individual 13 has a far greater incidence of antemortem tooth loss than the others. The existence of this variation negates this factor of dental health as a reliable line of evidence.

The Delhi woman does not exhibit evidence of dental calculus, which is an indicator of a diet high in carbohydrates and often leads to caries. On the other hand the two individuals from the Bennett site exhibit moderate calculus buildup indicative of a diet high in maize (Patterson, 1984).

The incidence of caries in the Delhi woman appears to be low. Interproximal caries are present on the mandibular left first and second molars (Figure 5). Occlusal caries are present on the lower right third molar and the maxillary right first premolar. Although it is difficult to determine the incidence of caries on the missing teeth, we can assume that at least some of the antemortem tooth loss was the result of caries.

Table 2. Comparison of the Prevalence of Caries

Individual	Number of Teeth Present	Number of Caries	% Teeth with Caries
Delhi	26	4	15%
5-1	10	9	39%
13	23	7	70%

In comparison, the individuals at the Bennett site had higher incidences of caries (Table 2). Even if we consider that caries may have been present in many if not all of the Delhi woman's missing teeth, she still would not have had as many caries as the two women from the Bennett site, thus suggesting that her diet was more varied and was not as dependent on a diet high in carbohydrates.

Two alveolar abscesses were observed in the Delhi individual. One alveolar abscess is located on the alveolar bone adjacent to the upper right first pre-molar. A second alveolar abscess is present in the bone just above the left mandibular first molar. The presence of these alveolar abscesses indicates that an infection was present at one time. Both of these teeth were infected with massive caries, which explains the resulting alveolar abscesses. An x-ray confirmed that the infection that resulted in the alveolar abscess in the mandible had significantly altered the condition of the bone (Figure 6). Information on the incidence of alveolar abscesses was only available for Bennett Individual 13 (Patterson, 1984). The number of abscesses that were observed in this individual (11 abscesses) directly correlates to the number of caries, and illustrates the severity of the caries. Similarly, the number of abscesses directly correlates to the number of caries for the Delhi woman.



Figure 6. X-ray displaying infected mandible

When the degree of attrition, the prevalence of caries and the number of alveolar abscesses of the Delhi woman is compared to that of the two individuals from the Bennett site it

becomes obvious that the condition of the Delhi woman's teeth is not consistent with those at the Bennett site. The degree of attrition and lack of caries indicates that the Delhi individual was not as dependent on maize for subsistence as those at the Bennett site.

SKELETAL HEALTH

Aside from the information about subsistence that can be gleaned from the dentition, the rest of the skeleton also provides some clues about her lifestyle. The Delhi woman does not exhibit any indicators of having suffered from iron deficiency anemia. Iron deficiency anemia is common in populations subsisting on maize. A number of individuals at the Bennett site suffered from iron deficiency anemia (Wright and Anderson, 1969). The fact that the Delhi woman does not bear any evidence of having suffered from iron deficiency serves as another piece of evidence that she did not subsist on a maize based diet.

Although, the Delhi woman did not suffer from iron deficiency her bones do exhibit evidence that she suffered from systemic stress during her development. In this individual stress suffered during childhood is manifest in the long bones in the form of Harris lines (Figure 7). Harris lines occur in the tibia, femur and fibula, and represent periods of stress when bone growth in length was arrested (Roberts and Manchester, 1995:176). Many individuals at the Bennett site display evidence of Harris lines and enamel hypoplasia. Patterson was able to determine the mean age at which hypoplastic defects occurred was at 3.2 ± 0.44 years (1984:218). The occurrence of the skeletal indicators of this stress between 2 and 4 years suggests post weaning metabolic disturbances. Weaning is a time of stress for children in many cultures often because adequate weanling food is not available. Populations relying upon maize for their subsistence frequently experience systemic stress around the time of weaning because the maize gruel replaces breast milk does not meet the dietary needs of a developing child. Systemic stress is not as frequent in hunter-gatherer groups because for the most part they subsist on a more well rounded diet. Although it is impossible to say what may have caused the Harris lines in the Delhi woman, we can speculate that the Delhi woman was not fed a weanling diet consisting primarily of corn. Rather, the development of Harris lines may have resulted from an illness that affected her during childhood or shortages in food.

PATHOLOGY AND TRAUMA

Aside from her poor dental health, the Delhi woman appears to have led a fairly healthy life. She does not appear to have suffered from any diseases or illnesses, but her bones do display the evidence of leading a physically challenging life. One area of her skeleton that tells the tale of hard work is her spinal column. This individual's spinal column appears to have been mildly affected by arthritis. In her case, osteoarthritis is manifested in the form of spinal osteophytes, or bone growth, on the superior and inferior surfaces of the cervical vertebra. The fourth, fifth, sixth, and seventh cervical vertebra exhibit pronounced lipping on the surfaces of the body and articular facets. Many Native groups in Eastern North America share a common burden-carrying strategy and similar incidences of osteoarthritis. In many cases, women employed the use of a tumpline across the forehead to carry heavy objects (Bridges, 1994:91). This method of transporting objects puts stress on the cervical vertebra, which coincidentally were the vertebra most affected by osteoarthritis in women.

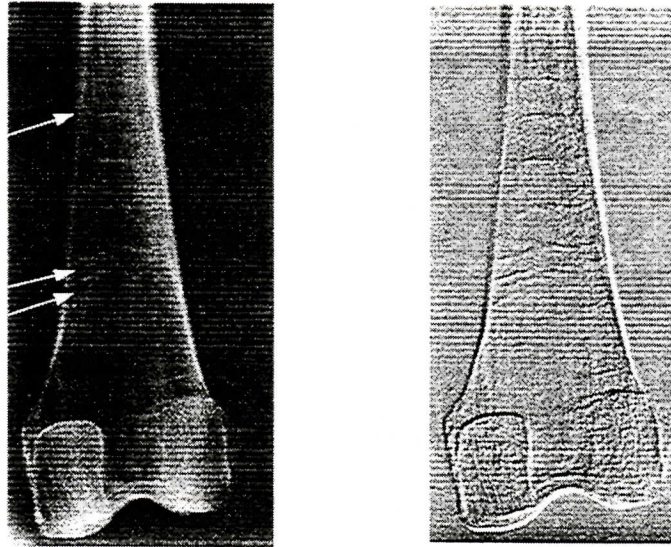


Figure 7. Harris lines

The temporomandibular joint exhibits some degeneration and evidence of arthritis. The temporomandibular joint is often affected by dental disease and attrition. Richards (1990) has observed a correlation between the degree of attrition and degeneration of the temporomandibular joint. The presence of extreme attrition and degeneration of the temporomandibular joint in the Delhi woman supports this conclusion. In addition, studies have displayed a correlation in females between the use of the teeth for cultural activities and temporomandibular joint disease. Although it is impossible to determine what sorts of activities this individual was involved in, we can speculate that her teeth may have been used for cultural activities.

This individual appears to have been in a major accident or was the victim of some sort of traumatic event. Well healed fractures are present on the distal shafts of the right radius and ulna. A Colles' fracture is present on the right radius (Figure 8) and a parry fracture (Figure 9) is present on the right ulna (Merbs, 1989). These types of fractures can result from a blow to the forearm or from the force exerted from an impact, as in the modern example of bracing oneself against the dash in a car accident (Spence, 2000). It is possible that this individual was involved in a confrontation that consisted of a blow to one or both of the forearms, coupled with injury to other areas of the body. The high degree of healing of these fractures suggests that this individual received some sort of treatment to set the bones and facilitate healing. Abnormal bone growth, in the form of a sequestrum, is present on the left ulna. A sequestrum, an isolated piece of dead bone, indicates the presence of an infection in the bone, commonly the result of trauma (Buikstra and Ubelaker, 1994:119). It is possible that the sequestrum was the result of the event that caused the fractures in the right arm. An injury of this sort would have undoubtedly caused a lot of pain for the individual and may have limited the use of that arm.



Figure 8. Colles' Fracture



Figure 9. Parry Fracture

The final evidence of trauma that was observed occurred at the acromial end of the left clavicle. This area exhibits bony growth, which appears to be arthritic. Dr. Michael Spence speculates that this area of the body may have been involved in the same traumatic event that fractured the bones of the forearms, causing a fracture or dislocation, which may have affected the normal development of this joint. Another possibility is that this joint may have been involved in repetitive habitual activities that may have altered the condition of the joint. It is difficult to relate this condition to a particular artifact or activity because many of the Early Iroquoian artifacts were manufactured out of wood and do not preserve well. A study conducted by Stirland (1986) has found a correlation between the non-fusion of the acromial process and archery. Virtually any habitual activity that is initiated at an early age, before fusion is complete, can permanently alter skeletal morphology. It is possible that this individual was engaged in a habitual activity such as gathering or the tending of fields that involved movement similar to that of archery, or that the site was fractured and was unable to heal properly.

CONCLUSION

Human skeletal remains can tell us much more about an individual or population than just incidence of pathological conditions and frequencies of skeletal attributes. Rather, skeletal remains can serve as a window onto the past activities, subsistence practices, and health of a particular individual. An osteobiography offers a more holistic analysis of the individual, which moves beyond quantitative analysis and seeks to give an identity back to the individual. Through the examination of the skeletal remains of the Delhi woman, this paper has attempted to offer some possible explanations to explain the condition of her remains. The presence of trauma and arthritis in this individual serve as evidence of a physically challenging life, which is consistent with the lifestyle of Early Ontario Iroquoians. The condition of the Delhi woman's dentition indicates that she did not subsist on a diet composed primarily of maize like those at the Bennett site, but rather was dependent on a mixed diet, composed partially of maize and other hunted and gathered foods. Although it is impossible to say definitively what activities this woman took part in or what her day to day life entailed, the results of this analysis have provided us with an idea of what life may have been like for a middle aged woman during Early Ontario Iroquoian times.

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